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PEDIATRIC CIRCUMCISION (KHATNA): PRACTICE PATTERNS, TECHNIQUES, AND EARLY COMPLICATIONS

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Abstract

Background: *Circumcision (Khatna) is among the most commonly performed pediatric procedures. While benefits are recognized, complications occur—especially with inexperienced providers, non-sterile conditions, or higher-risk ages. We evaluated outcomes and practice factors in a pediatric surgical unit and interpreted them against contemporary evidence.*

Methods: *Cross-sectional study conducted at Liaquat University of Medical & Health Sciences Jamshoro, from October 2022 to October 2025. Boys aged 1 month to 14 years undergoing circumcision were enrolled by convenience sampling (n=145). Exclusions: age <1 month or >14 years; congenital external genital anomalies. Data collected included age, indication, method, provider, anesthesia, setting, and outcomes at 7–10 and 30 days. Complications were graded as minor (requiring conservative care), moderate (requiring outpatient procedural intervention), or severe (requiring admission, re-operation, or transfusion). Descriptive statistics with 95% confidence intervals (CIs) were used.*

Results: *Cultural/religious indications predominated (82.8%). Techniques: Plastibell 58.6%,* ***Mogen clamp*** *19.3%, sleeve/dissection 16.6%, freehand 5.5%. Local anesthesia 75.9%. Overall complications 7.6% (11/145; 95% CI 3.9–13.1): minor 6.2%, moderate 0.7%, severe 0.7% (95% CI 0.02–3.8). By age: 11.5% (1–11 months), 7.3% (12–59 months), 3.1% (5–9 years), 5.0% (10–14 years). By method: Plastibell 8.2%,* ***Mogen clamp*** *7.1%, sleeve 4.2%, freehand 12.5%. Common events: minor bleeding (2.8%), localized infection (2.1%), and Plastibell device issues (1.4%). One child required suturing; one required re-operation. No sequelae were documented at 30 days.*

Conclusions: *In a supervised, sterile environment, pediatric circumcision showed complication rates within international ranges for infant/child circumcision by medical providers. Risk reduction depends on consistent training, correct device sizing and glans protection, awareness of the 4–12-week "mini-puberty" bleeding risk, and standardized grading with reliable follow-up.*

INTRODUCTION

Circumcision has been practiced across civilizations for millennia, with depictions as early as ancient Egypt [1]. Beyond cultural and religious significance, reported health benefits include improved hygiene, fewer infant urinary tract infections, reduced transmission of some sexually transmitted infections,

and a lower risk of penile cancer in adulthood [2–7]. As with any operation, adverse events can occur; frequency and severity depend on patient age, anatomy, provider skill, technique, and sterility.

A systematic review found that medically performed neonatal/infant circumcision has a median any-complication frequency near 1.5% (range 0–16%), and child circumcision about 6% (2–14%); severe events are rare (0–3%) but rise with older age, inexperienced providers, mass campaigns, and non-sterile settings [8]. Device-focused reviews describe pitfalls of mis-sizing or misplacement of clamps/bells, inadequate hemostasis, and lack of glans protection—alongside the impact of timing: the 4–12 week "mini-puberty" window carries a higher bleeding risk due to increased vascularity [9–11]. Pakistan's Plastibell experience generally shows low, mostly minor complications in medical settings [4].

We aimed to (i) describe complications and their severity among boys undergoing circumcision at a tertiary pediatric unit and (ii) align local practice with evidence-based safety steps across techniques and ages.

Methods

This was a cross-sectional descriptive study conducted in the Department of Pediatric Surgery, Liaquat University of Medical & Health Sciences (LUMHS), Jamshoro/Hyderabad, from October 2022 to October 2025. A sample size of 145 participants was calculated using WHO sample size calculation software, assuming an anticipated complication proportion of 10.3% [4], a 95% confidence level, and a 5% margin of error. Consecutive eligible patients were enrolled using convenience sampling.

Boys aged 1 month to 14 years who presented for circumcision during the study period and whose parents/guardians provided informed consent were included. Patients were excluded if they were younger than 1 month or older than 14 years, or if they had known congenital external genital anomalies such as ambiguous genitalia, disorders of sex development (including congenital adrenal hyperplasia), or hypospadias. A pediatric surgeon performed a focused preoperative assessment, including a brief bleeding and birth history and a complete genital examination to exclude hypospadias, chordee, buried or inconspicuous penis, penoscrotal web, and active local infection.

Circumcision was performed under either local or general anesthesia according to age, clinical condition, and anesthetic assessment. Depending on age, penile anatomy, and surgeon preference, one of the following techniques was used: Plastibell device, Gomco clamp, sleeve/dissection method, or freehand/forceps-guided circumcision. For device-based methods (Plastibell, Gomco or other Mogen-type clamps), appropriate device size was selected and proper positioning was ensured so that the bell or clamp protected the glans before application of any ligature or clamp. Deliberate hemostasis was confirmed at the end of the procedure prior to dressing application.

A standardized safety protocol was followed in all cases. This included (i) exclusion of contraindications as above, (ii) careful device sizing and confirmation of glans protection before tightening any suture or clamp, and (iii) a final hemostasis check at the end of surgery. Parents/guardians were counseled before discharge regarding wound care, the expected course of any circumcision device, and warning signs such as persistent bleeding, marked swelling, urinary difficulty, or signs of infection. Where scheduling allowed, purely elective infant circumcisions were preferentially planned outside the 4–12-week "mini-puberty" period [9–12].

Demographic data (age in months and categorized age groups), indication for circumcision (cultural/religious vs. medical), circumcision technique, provider cadre (consultant pediatric surgeon, supervised resident, or medical officer/nurse), type of anesthesia (local vs. general), and setting (procedure room/minor operating theatre vs. main operating theatre) were recorded for each participant. Patients were routinely scheduled for follow-up at 7–10 days (early outcome assessment) and at 30 days (late outcome assessment); any unscheduled visits were also documented.

Postoperative complications were classified according to the grading systems of Weiss et al. [8] and Krill et al. [9]. Minor complications were those managed with conservative measures alone, such as local pressure, topical or oral antibiotics, or outpatient device removal. Moderate complications were those requiring an outpatient procedural intervention, such as additional suturing. Severe complications included events requiring hospital admission, re-operation, or

blood transfusion, or those associated with life-threatening injury. Trivial oozing that stopped with brief pressure and purely cosmetic concerns (perceived excess or insufficient foreskin) were not counted as complications unless they necessitated an active intervention.

Parents/guardians provided informed consent before enrollment. Data were recorded in de-identified form, and no personal identifiers were retained to ensure confidentiality.

Statistical Data Analysis:

Data were entered and analyzed using SPSS version 23.0. Frequencies and percentages were calculated for qualitative variables such as indication for circumcision, circumcision technique, provider cadre, anesthesia type, setting, and complication categories (minor, moderate, severe). Quantitative variables, including age (in months), were summarized using mean ± standard deviation or median with interquartile range, as appropriate. Descriptive 95% confidence intervals were calculated for overall and stratified complication rates. Exploratory cross-tabulations were performed to examine the distribution of complications across age groups, circumcision methods, anesthesia type, and procedural setting.

Results

A total of 145 boys underwent circumcision (Table 1). Most were aged 1–11 months (35.9%), and circumcision was predominantly for cultural/religious reasons (82.8%). Plastibell was the commonest technique (58.6%), followed by Mogen, sleeve/dissection, and freehand/forceps-guided methods. Over half of the procedures were performed by supervised residents, three-quarters under local anesthesia, and 70.3% in a procedure room or minor theatre. Follow-up was achieved in 91.7% at 7–10 days and 84.8% at 30 days.

Overall, 11/145 children experienced complications (7.6%; 95% CI 3.9–13.1), mostly minor (6.2%); one was moderate (0.7%) and one severe (0.7%; 95% CI 0.02–3.8) (Table 4). Events included minor bleeding (2.8%), localized infection (2.1%), Plastibell device issues (1.4%), one episode of bleeding requiring suturing (0.7%), and one severe hemorrhage requiring admission and re-operation (0.7%). Ten of eleven cases were managed in the clinic, and all had resolved without sequelae by 30 days. Complications were more frequent in younger infants (11.5% at 1–11 months) and declined with age (Table 2). By technique, complication rates were 8.2% for Plastibell, 7.1% for Mogen, 4.2% for sleeve/dissection, and 12.5% for freehand/forceps-guided circumcision; the only severe event followed a freehand procedure (Table 3).

Cohort characteristics

Table 1. Baseline characteristics (n=145)

Variable	Category	n (%)
Age group	1–11 months	52 (35.9%)
	12–59 months	41 (28.3%)
	60–119 months (5–9 y)	32 (22.1%)
	120–168 months (10–14 y)	20 (13.8%)
Indication	Cultural/religious	120 (82.8%)
	Medical	25 (17.2%)

Technique	Plastibell	85 (58.6%)
	Mogen	28 (19.3%)
	Sleeve/dissection	24 (16.6%)
	Freehand/forceps-guided	8 (5.5%)
Provider	Pediatric surgeon	40 (27.6%)
	Resident (supervised)	75 (51.7%)
	Medical officer/nurse	30 (20.7%)
Anesthesia	Local	110 (75.9%)
	General	35 (24.1%)
Setting	Procedure room/minor OT	102 (70.3%)
	Main OT	43 (29.7%)
Follow-up	7–10 days	133/145 (91.7%)
	30 days	123/145 (84.8%)

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Table 2. Complication frequency by age group

Age group	Complications (n/N)	%
1–11 months	6 / 52	11.5%
12–59 months	3 / 41	7.3%
60–119 months	1 / 32	3.1%
120–168 months	1 / 20	5.0%

Table 3. Complication frequency by technique

Technique	Complications (n/N)	%	Most common types
Plastibell	7 / 85	8.2%	Minor bleeding; infection; device retention

Mogen	2 / 28	7.1%	Infection; bleeding requiring suturing
Sleeve/dissection	1 / 24	4.2%	Minor bleeding
Freehand/forceps-guided	1 / 8	12.5%	Severe hemorrhage → re-operation/admission

Table 4. Complication severity, type, and management (n=11)

Severity	Types	n	Management	Outcome at 30 days
Minor	Bleeding controlled by pressure; local infection; Plastibell ring issue	9	Pressure; topical/systemic antibiotics; OPD device removal	Resolved
Moderate	Bleeding requiring suturing	1	Outpatient suturing	Resolved
Severe	Hemorrhage requiring admission and re-operation	1	Return to OT; hemostasis	Resolved

Technique-specific precautions are essential for safe pediatric circumcision. With Mogen clamps, the main risks—glans injury, asymmetric excision, and bleeding—are reduced by proper device selection, confirming full glans protection, maintaining adequate compression before cutting, and re-checking hemostasis. For Plastibell, loose ligatures, slippage, and infection are minimized by choosing the correct bell size, securing the ligature at the corona, ensuring stable seating, and educating caregivers about expected ring separation and danger signs. In sleeve or freehand techniques, bleeding, asymmetry, and wound-edge problems are best prevented by precise marking, meticulous hemostasis, layered absorbable closure, and careful inspection before dressing (Table 5).

Technique-specific prevention

Table 5. Technique-specific risks and prevention

Technique	Key risks (mechanism)	Prevention

Mogen clamp	Glans injury or amputation if clamp applied beyond glans; asymmetric excision due to poor tissue alignment; bleeding from dorsal vessels if not adequately crushed or ligated	Correct bell size; confirm bell fully covers glans; maintain compression minutes before excision; re-check hemostasis
Plastibell	Loose ligature/slippage → incomplete circumcision/bleeding; infection in diaper environment	Correct bell size; secure ligature at corona; confirm stable seating; teach caregivers expected separation and red flags
Sleeve/freehand	Bleeding if hemostasis insufficient; asymmetric excision; wound edge problems	Precise markings; meticulous hemostasis; layered absorbable closure; inspection before dressing

Discussion

In this supervised pediatric surgical setting, the overall (7.6%) and severe (0.7%) complication rates fall within reported international ranges for medically performed circumcision [8]. Most complications were minor and managed conservatively, supporting the safety of circumcision when performed with sterile technique, standardized protocols, and trained staff. The higher complication rate in younger infants, particularly bleeding, is consistent with the "mini-puberty" period (4–12 weeks) of increased penile vascularity described in prior studies [9–12], and supports performing circumcision either in the first week of life or outside this window when feasible. Technique-related patterns were in keeping with the literature. Plastibell, though associated with minor device-related issues, remained safe with appropriate sizing, secure ligature, and good caregiver counseling. The single severe hemorrhage after a freehand procedure underscores the importance of inherent glans protection and meticulous hemostasis, especially with non-device techniques [8,9]. Strengths of this study include prospective follow-up at 7–10 and 30 days and standardized complication grading; limitations are convenience sampling, modest sample size for subgroup comparisons, and lack of longer-term follow-up for late complications such as meatal stenosis. These findings support a simple safety bundle: careful preoperative screening, correct device sizing and glans protection, deliberate hemostasis, avoidance of elective procedures during 4–12 weeks when possible, structured caregiver counseling, and routine complication logging by technique and provider for continuous quality improvement.

Conclusions

Medically supervised pediatric circumcision in a sterile setting demonstrated a low overall complication rate (7.6%) and a very low severe complication rate (0.7%), with most events minor, manageable in the outpatient clinic, and fully resolved by 30 days. Complications were more frequent in younger infants, consistent with the physiological "mini-puberty" period, and the only severe hemorrhage followed a freehand procedure, underscoring the value of techniques with inherent glans protection and deliberate hemostasis. These findings support the safety of circumcision when performed by trained providers using standardized screening, appropriate device selection, structured caregiver counseling, and planned follow-up. Larger studies with longer follow-up are warranted to better

define late complications and to further refine age- and technique-specific best practices.

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Conflicts of interest
None declared.

REFERENCES

Dunsmuir WD, Gordon EM. The history of circumcision. BJU Int. 1999;83(Suppl 1):1-12. doi:10.1046/j.1464-410x.1999.0830s1001.x

Shabad AL. Some aspects of etiology and prevention of penile cancer. J Urol. 1964;92:696-702. doi:10.1016/S0022-5347(17)64034-5.

Schoen EJ. Neonatal circumcision and penile cancer. BMJ. 1996;313(7048):46-47. doi:10.1136/bmj.313.7048.46

Razzaq S, Mehmood MS, Tahir TH, Masood T, Ghaffar S. Safety of the Plastibell circumcision in neonates, infants and older children. Int J Health Sci (Qassim). 2018;12(5):10-13.

de Sanjosé S, Diaz M, Castellsagué X, Clifford G, Bruni L, Muñoz N, Bosch FX. Worldwide prevalence and genotype distribution of cervical human papillomavirus DNA in women with normal cytology: a meta-analysis. Lancet Infect Dis. 2007;7(7):453-459. doi:10.1016/S1473-3099(07)70158-5.

Bergeron C, Barrasso R, Beaudenon S, Flamant P, Croissant O, Orth G. Human papillomaviruses associated with cervical intraepithelial neoplasia: great diversity and distinct distribution in low- and high-grade lesions. Am J Surg Pathol. 1992;16(7):641-649. doi:10.1097/00000478-199207000-00002.

Cupp MR, Malek RS, Goellner JR, Smith TF, Espy MJ. The detection of human papillomavirus deoxyribonucleic acid in intraepithelial, in situ, verrucous and invasive carcinoma of the penis. J Urol. 1995;154(3):1024-1029. doi:10.1016/S0022-5347(01)66967-2.

Weiss, Helen A, Larke, Natasha, Halperin, Daniel & Schenker, Inon. 2010. Complications of circumcision in male neonates, infants and children: a systematic review. BMC urology 10: 1-13.

Krill, Aaron J, Palmer, Lane S & Palmer, Jeffrey S. 2011. Complications of circumcision. The scientific world journal 11: 2458-2468.

Horowitz, M. & Gershbein, A. B.. 2001. Gomco circumcision: When is it safe?. J Pediatr Surg 36: 1047-1049. doi: 10.1053/jpsu.2001.24739.

Banieghbal, B.. 2009. Optimal time for neonatal circumcision: an observation-based study. J Pediatr Urol 5: 359-62. doi: 10.1016/j.jpurol.2009.01.002.

Gee, W. F. & Ansell, J. S.. 1976. Neonatal circumcision: a ten-year overview: with comparison of the Gomco clamp and the Plastibell device. Pediatrics 58: 824-827.

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